BRANCH OF FOREST INSECT AND DISEASE PREVENTION AND CONTROL
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Forest Insect Conditions on the Bridger National Forest, 1971

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FOREST INSECT CONDITIONS ON THE BRIDGER NATIONAL FOREST, 1971

This is a discussion of the most important forest insect problems on the Bridger National Forest during 1971. The information in this report was compiled from an aerial survey, past records and evaluation reports, systematic on-the-ground detection and evaluation surveys, and permanent trend plots.

As in past years, the single most important insect problem is the mountain pine beetle in lodgepole pine. Epidemic conditions persist in both Divisions, but the peak of tree killing has finally been reached. Most of the longstanding infestations have declined from within due to progressive attrition, while other more active infestations have pushed into higher elevations, but they too are on the decline because of elevation and/or lack of suitable host material. In a few areas, in both Divisions, tree killing will increase but the overall tree losses will continue to decline. Control, other than by logging, is not recommended.

The spruce budworm continued to defoliate Douglas-fir, subalpine fir, and to a lesser extent, Englemann spruce. Although defoliation intensity increased, the extent of visible damage decreased for the third consecutive year. Obvious damage was in the form of top and branch killing while more subtle damage may have been a reduction in tree growth. An analysis of egg mass data portends an even greater increase in budworm feeding and subsequent damage in 1972. If these heavy populations materialize, some mortality of suppressed understory can be expected. Control during 1972 is not recommended.

Mountain pine beetle, Dendroctonus ponderosae Hopk.

The mountain pine beetle has been epidemic in lodgepole pine stands in both Divisions since the early 1960's. Since then the infestation has spread throughout most of the susceptible lodgepole pine type, resulting in heavy tree killing in many areas. Generally, there has been an inverse relationship between tree mortality and elevation; i.e., heaviest mortality has occurred in low elevations while, conversely, less tree killing has occurred in the higher elevations. It is evident now, however, that the crest of tree killing by the beetle has been reached and although mortality will continue for several years, it is on the decline and will continue to retrogress forest-wide. A more detailed discussion of the present and future status of the mountain pine beetle in each Division follows:

Wyoming Division

This infestation was nurtured in the lower elevations. During the past decade to the present it increased in intensity and moved into the susceptible lodgepole stands in the upper reaches of the Greys and Little Greys River. Equally serious infestations persisted in the upper drainages of Beaver Creek to the east, but they declined several years ago because of a lack of suitable host type and extensive logging. Widely scattered outbreaks have occurred in many of the tributaries of the Salt River and in the upper drainages of LaBarge Creek and Hams Fork. Most of these widely separated infestations have declined or are on the verge of declining due to natural factors.

The boundaries of the serious infestation in the Greys River proper remains essentially unchanged from those of last year (see appended map). The scattered infestations north of Deadman Creek have been declining for several years while those south of Deadman Creek and in the Little Greys River have just recently shown a decrease. Tree killing will occur in all of these areas for several years but on an ever decreasing scale. As the infestation continues its (slow) march to the south and elevation increases, the extent and degree of tree killing will become considerably less. Stand structure data taken last year[1/] show that although many of the southern-most stands along the river bottom had active infestations, their structure, in the form of relatively small diameter classes, was not conducive to maintaining, much less increasing, a high level of tree killing. The increased elevation alone will preclude extreme tree mortality. In many of the higher Regions, particularly in the upper reaches of North Piney, Fish and South Piney Creeks, the beetle has moved into the whitebark-limber pine stands.

At present the area of immediate concern is along the high bench west of the Greys River and between Bear and North Crow Creeks. A gradual buildup has been underway for the past two years and recent biological data indicate a possible increasing trend. Ground examinations made during late September and early October indicated an attack ratio of 1:1.3, meaning that for every tree killed in 1970, 1.3 trees were successfully attacked in 1971. Of more than 100 trees attacked during this two-year period, the average d.b.h. was 13 inches. Although some areas in this general area have been logged rather intensively, there is still lodgepole pine of sufficient size and quantity to support an infestation for several years. On the optimistic side, however, it is doubtful whether the final mortality in this area will be as severe as that which has occurred elsewhere on the Forest. First, the stand is a mixture rather than a monotype and secondly, it is at a relatively

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1/ See "Forest Insect Conditions on the Bridger National Forest, 1970."

high elevation--8,500 to 9,000 feet. Past experience has shown that both of these factors will prevent heavy tree killing. Many of the lodgepole stands to the south, including those in the upper most parts of the Greys River and LaBarge Creek are even higher and should remain relatively immune to heavy mountain pine beetle damage.

Efforts should be made to salvage log as many of the infested areas as possible. In some of the most heavily damaged stands upwards of 50 percent of the merchantable volume may be lost, but in some of the better stands the residual volume may be sufficient to justify a sale program. The faster these depleted areas can be converted to a vigorous, youthful growing state the quicker long range control of the beetle will be realized. If these stands are left unchanged, history will only repeat itself. The stands will attain susceptible age and size and nurture another cycle of the beetle in 30 to 40 years.

Bridger Division

This infestation, in progress since 1961, has now spread throughout the entire range of lodgepole pine along the West Slope of the Wind River Range (see appended map). In most areas, from Boulder Lake north, tree killing is declining. Similar to the situation in the Wyoming Division, tree killing has declined at low elevations, and beetle populations in search of more suitable conditions have moved into the previously uninfested high elevation stands and in some areas have run out of host type completely. In many areas, the mountain pine beetle has moved beyond the Wilderness boundary and is now killing whitebark-limber pine. Many of the high elevation lodgepole stands will continue to support beetle populations for several years, but tree killing will continue to decline.

Remaining areas showing a potential for increase are the widely scattered lodgepole stands in the southern half of the Division, between Boulder Lake and the Sweetwater River.

Previous estimates of heavy mortality in the well stocked, large diameter lodgepole stand above Spring Creek Park have failed to materialize. Yearly on-the-ground measurements[1/] made in this area indicate that peak tree killing may have already been reached. A resumé of this data follows:

1/ See "Forest Insect Conditions on the Bridger National Forest, 1970." A more detailed discussion of this trend plot study is forthcoming.

Tree Sp.	TREES PER ACRE: Initial Green Stand	Killed During 1967	1968	1969	1970	1971	Total Dead	Percent
LP	219.86	5.98*	2.03	4.41	6.62	2.79	21.83	12.0
WLP	21.13	0.09*	0.85	0.75	0.60	0.25	2.54	9.9
Total	240.99	6.07*	2.88	5.16	7.22	3.04	24.37	10.1

* Accumulated mortality.

At this time slightly more than 24 trees per acre have been killed with peak killing occurring in 1970. This amounts to approximately 10 percent of the host type. There may be a remote possibility, however, that the 1970 level is simply a secondary or false peak and that the final apex of tree killing has yet to come. If and when it does come, however, it will probably happen in 1972. However, trend data from another area did not exhibit this bimodal characteristic.

It is interesting to note that the beetle has killed approximately the same percentage of lodgepole pine as whitebark-limber pine, 12 and 10 percent respectively, even though the frequency of lodgepole pine is 10 times greater than the other host species. The biological implication of this, realizing that it is only one stand, is that the beetles exhibit no preference of host type, other than selecting the larger diameter trees of both species. The larger trees are killed first, disproportionate to their occurrence in the stand. As the infestation progresses, smaller and smaller trees are killed.

In previous evaluation reports, we have discussed at some length the various management alternatives for combating the mountain pine beetle problem. Our recommendation then was that the infestations were too firmly established and widespread for any type of individual tree control program to be effective. Logging in the infested stands to salvage dead and dying timber and ahead of the infestations to utilize timber ultimately threatened appeared to be the most practical alternative. This recommendation still stands.

The areas of most concern now are on the west side of the Greys River between Bear and North Crow Creeks and in the Bridger Division, below Boulder Lake. Stands in areas where logging is not prohibited and which contain the larger diameter trees should be given primary consideration.

Western spruce budworm, Choristoneura occidentalis Free.

This is the sixth consecutive year of spruce budworm defoliation in the Wyoming Division. Since 1965, the first year of noticeable feeding,

the infestation increased steadily, reached a high of more than 95,000 acres in 1969, then began to decline. A year-by-year account of budworm defoliation by damage intensity from 1965 to the present follows:

DEFOLIATION INTENSITY

Year	Light	Medium	Heavy	Total
1965	10,000	--	--	10,000
1966	33,000	800	--	33,800
1967	19,500	30,700	1,600	51,800
1968	33,300	53,000	8,900	95,200
1969	69,800	3,000	--	72,800
1970	46,800	9,000	--	55,800
1971	9,000	7,600	8,600	25,200

The infestation boundaries decreased considerably in the Wyoming Division but expanded to the north in portions of the Targhee and Teton National Forests (see appended map). The heaviest defoliation is generally confined to the Douglas-fir type in most of the small tributaries of the Grand Canyon of the Snake River and was visible from the main highway from July through fall.

Systematic on-the-ground defoliation and egg mass evaluation surveys were conducted in five areas last fall. These data, along with last year's (1970) defoliation estimates follow:

Location	1971 Defoliation Predicted 1/ (Percent)	1971 Defoliation Actual (Percent)	1971 Egg Masses Per 30" Branch (Number)	1972 Defoliation Predictions (Percent)	1972 Predictions (Class)
Roos Cr.	90-100	99	154	90-100	Static
Porcupine	51- 90	55	82	90-100	Increasing
Squaw Cr.	25- 50	51	81	90-100	Increasing
Black Canyon	25- 50	13	--		
Bull Hollow	15- 25	40	45	51- 90	Increasing
Bailey Cr.	<15	27	--		
Higby Cr.	--	--	93	90-100	Increasing

1/ Based on 1970 Egg Mass Survey.

Defoliation, as measured on the ground, did not depart significantly from that predicted in 1970. The heaviest damage occurred in Roos Creek where almost complete removal of the new growth was recorded. This area and some areas in Pine Creek have undergone several successive years of heavy defoliation, but as yet no tree mortality has occurred. The most serious damage is confined to the upper crowns of the heaviest defoliated trees where top and branch killing has occurred. No doubt there has also been some growth loss.

It appears now that the three-year downward trend will finally come to an end. Unusually heavy egg mass deposition indicates increased activity for 1972. There will probably be an extension of the present infestation boundaries, but most important, there will be a significant increase in feeding damage unless natural control factors intervene. If the predictions run true to course, moderate to heavy defoliation can be expected throughout most of the area now infested. In addition to an increase in top and branch killing, mortality of some of the understory in the heaviest defoliated areas now appears imminent. However, as has been the case in other budworm areas, most of this understory mortality will be in suppressed trees. Probably the most significant impact on the stand at this time will be in the form of growth loss. Most of the infested areas, however, are inoperable or in the travel and water influence zones. Control is not recommended at this time.

GENERALIZED AREAS OF MOUNTAIN PINE BEETLE OUTBREAKS BRIDGER NATL. FOREST WYOMING DIVISION 1971

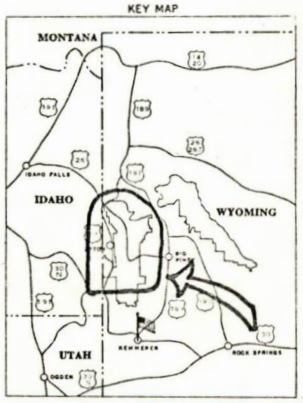
LEGEND

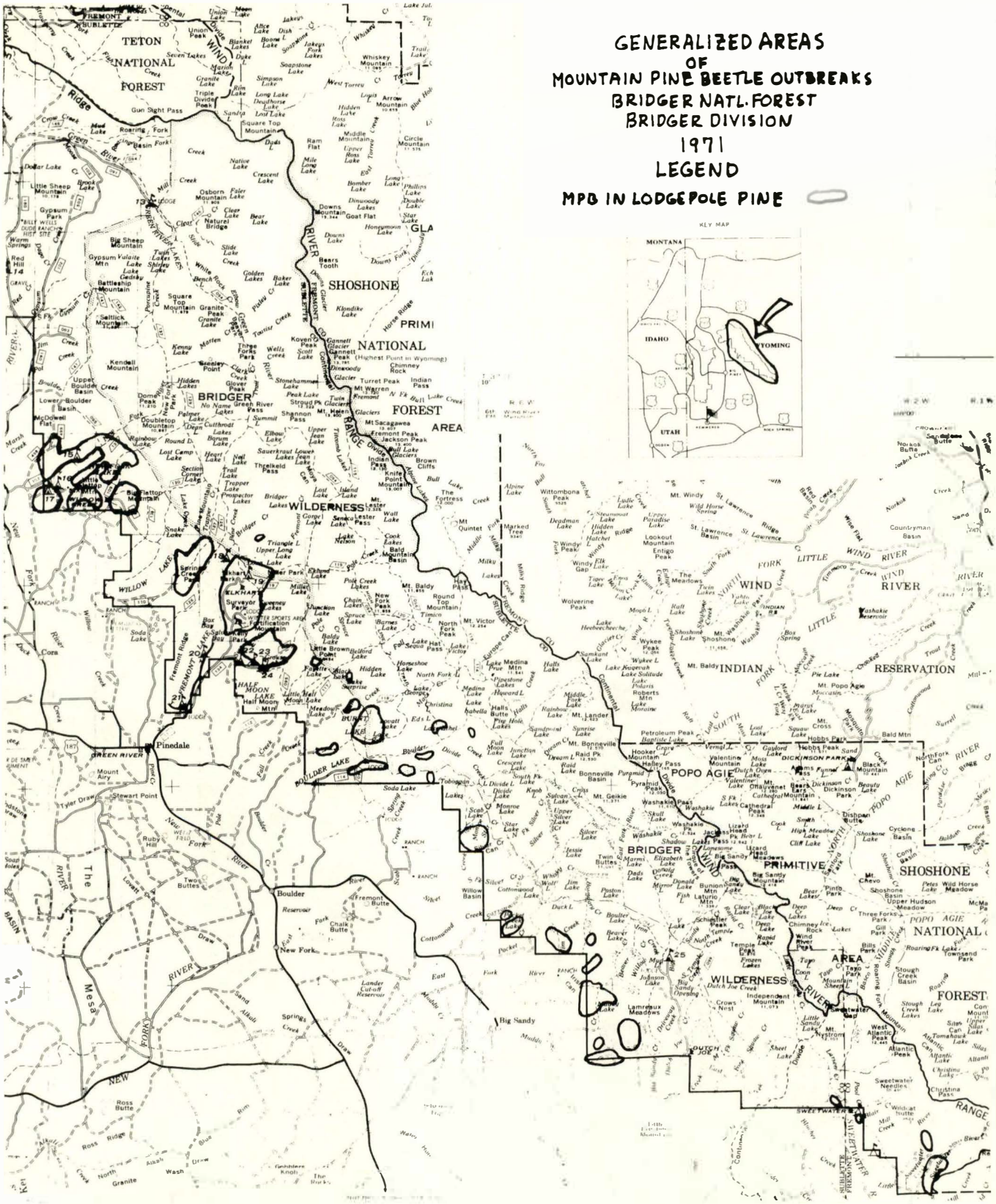
MPB IN LODGEPOLE PINE

MPB IN LIMBER PINE X

VERY WIDELY SCATTERED LPP

KEY MAP




GENERALIZED AREAS
OF
MOUNTAIN PINE BEETLE OUTBREAKS
BRIDGER NATL. FOREST
BRIDGER DIVISION
1971
LEGEND
MPB IN LODGEPOLE PINE
KEY MAP
MONTANA
IDAHO
WYOMING
UTAH
TETON
NATIONAL
FOREST
SHOSHONE
NATIONAL
FOREST
BRIDGER
WILDERNESS
AREA
WIND
RIVER
INDIAN
RESERVATION
POPO AGIE
WILDERNESS
BRIDGER
WILDERNESS
PRIMITIVE
AREA
SHOSHONE
NATIONAL
FOREST
Pinedale
Boulder
New Fork
Big Sandy
Mount Airy
Stewart Point
Tyler Draw
Ruby Hill
Two Buttes
Mesa
Ross Butte
Ross Ridge
Granite Wash
Cora
Soda Lake
Fremont Butte
Chalk Butte
Lander Cut-off Reservoir
Sand Springs
Alkali Draw
Gibbons Knob
The Bucks
Mt. Bonneville
Mt. Lander
Mt. Baldy
Mt. Victor
Mt. Quintet
Mt. Windy
Mt. Washakie
Mt. Shoshone
Mt. Cross
Mt. Popo Agie
Mt. Nystrom
Atlantic Peak
Sweetwater Needles
Christina Pass
Wildcat Butte
Norbak Butte
Countryman Basin
Lookout Mountain
Entigo Peak
Wolverine Peak
Petroleum Peak
Bald Mtn
Dishpan Butte
Cyclone Basin
Wild Horse Meadow
Townsend Park
Stough Creek Basin
Sweetwater Gap
Pine Lake
Yashakie Reservoir
Green River
Fremont Ridge
Willow Lake
Elkhart Park
Half Moon Lake
Boulder Lake
Big Sandy Opening
Dutch Joe Creek
Crows Nest
Lamreaux Meadows
Sheep Mountain
Gypsum Mtn
Battleship Mountain
Saltlick Mountain
Kendall Mountain
Lower Boulder Basin
McDowell Flat
Doubletop Mountain
Gun Sight Pass
Square Top Mountain
Granite Peak
Big Sheep Mountain
Little Sheep Mountain
Red Hill
Warm Springs
Gypsum Valaite
Twin Lakes
Shirley Lake
Lake Cadzow
Golden Lakes
Baker Lake
Three Forks Park
Scooley Point
Hidden Lakes
Glover Peak
Green River Lakes
Dome Peak
Palmer Lake
Deep Cutthroat Lakes
Rainbow Lake
Round D.
Lost Camp Lake
Section Corner Lake
Trail Lake
Prospector Lakes
Trapper Lake
Bridger Lake
Snake Lake
Triangle L
Upper Long Lake
Surveyor Lake
Hidden Lake
Little Brown Pond
Baldy Lake
Halford Lake
Spruce Lake
Barnes Lake
Timico L
Fremont Lakes
Hat Pass
Lake Georgetown
Christina Lake
Isabella Lake
Halls Butte
Rainbow Lake
Sandmint Lake
Sunrise Lake
Pine Hole Lakes
Boulder Creek
Fall Creek
Soda Lake
Tobaggan Lake
Divide Lake
Monroe Lake
Star Lake
Scab Lake
Silver Lake
Upper Silver Lake
Sullivan Lake
Washakie Pass
Shadow Lake
Lizard Head Meadows
Big Sandy Lake
Big Sandy Mountain
Elizabeth Lake
Twin Buttes
Dads Lake
Piston Lake
Willow Basin
Cottonwood Lake
Duck L
Jim Lake
Jessie Lake
Boulder Lake
Beaver Lake
Schaffer Peak
Temple Peak
Rapid Lake
Wind River Park
Bills Park
Roaring Fk Lake
Loch Leven
Lake Louise
Lake Solitude
Lake Polaris
Roberts Mtn
Lake Moraine
Hooker Mountain
Haley Pass
Valentine Mountain
Valentine Lake
Moss Lake
Gaylord Lake
Hobbs Peak
Hobbs Park
Adams Pass
Black Mountain
Beaver Lake
Dickinson Park
Beauty Lake
Cathedral Mountain
Middle L
Smith
High Meadow Lake
Cliff Lake
Shoshone Lake
Lonesome Lake
Big Sandy Pass
Big Sandy Meadows
Big Sandy Mountain
Mt. Chevo
Shoshone Basin
Petes Lake
Upper Hudson Meadow
Three Forks Park
Gill Park
Chimney Ice Rock
Lakes
Pinto Park
Bear Lakes
Deep Lakes
Pinto Lake
Bunion Mtn
Laturio Mtn
Fish Lake
Donald Lake
Mirror Lake
Johnson Lake
Jim Lake
Duck L
Cottonwood Lake
Willow Basin
Pocket
Fork
Big Sandy
Middle
Sheet Lake
Dutch Joe
Sweetwater Gap
Sweetwater Needles
Christina Lake
Atlantic Lake
Atlantic Peak
Mt. Nystrom
Sweetwater
Roaring Fk Lake
Townsend Park
Stough Creek Basin
Mountain Sheep
Tayo Park
Tayo Lake
Coon Lake
Mt. Mercer
Mt. Sheridan
Independent Mountain
Lizard Head
Big Sandy Lake
Big Sandy Pass
Big Sandy Meadows
Big Sandy Mountain
Elizabeth Lake
Twin Buttes
Dads Lake
Piston Lake
Willow Basin
Cottonwood Lake
Duck L
Jim Lake
Jessie Lake
Boulder Lake
Beaver Lake
Schaffer Peak
Temple Peak
Rapid Lake
Wind River Park
Bills Park
Roaring Fk Lake
Loch Leven
Lake Louise
Lake Solitude
Lake Polaris
Roberts Mtn
Lake Moraine
Hooker Mountain
Haley Pass
Valentine Mountain
Valentine Lake
Moss Lake
Gaylord Lake
Hobbs Peak
Hobbs Park
Adams Pass
Black Mountain
Beaver Lake
Dickinson Park
Beauty Lake
Cathedral Mountain
Middle L
Smith
High Meadow Lake
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Shoshone Lake
Lonesome Lake
Big Sandy Pass
Big Sandy Meadows
Big Sandy Mountain
Mt. Chevo
Shoshone Basin
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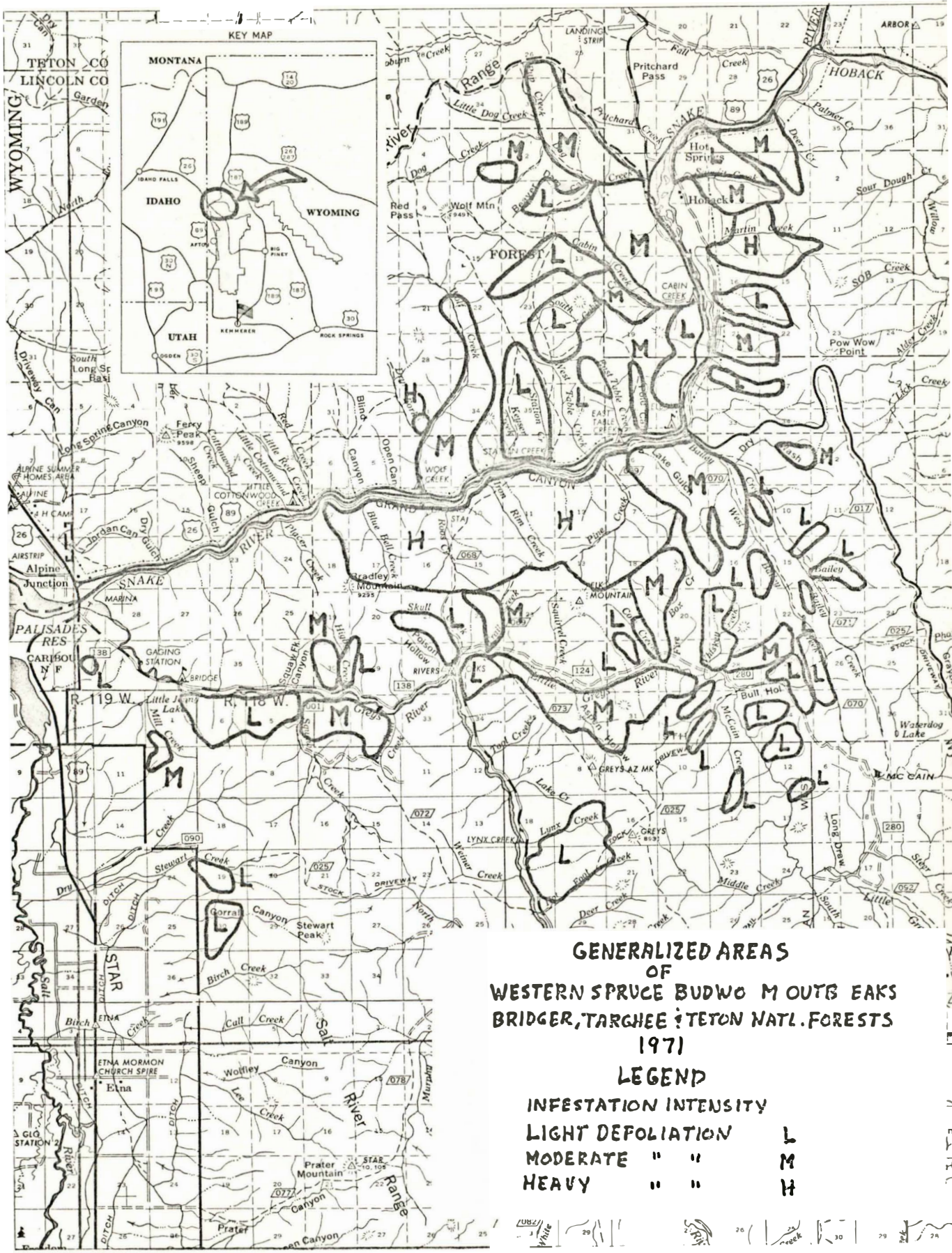
Upper Hudson Meadow
Three Forks Park
Gill Park
Chimney Ice Rock
Lakes
Pinto Park
Bear Lakes
Deep Lakes
Pinto Lake
Bunion Mtn
Laturio Mtn
Fish Lake
Donald Lake
Mirror Lake
Johnson Lake
Jim Lake
Duck L
Cottonwood Lake
Willow Basin
Pocket
Fork
Big Sandy
Middle
Sheet Lake
Dutch Joe
Sweetwater Gap
Sweetwater Needles
Christina Lake
Atlantic Lake
Atlantic Peak
Mt. Nystrom
Sweetwater
Roaring Fk Lake
Townsend Park
Stough Creek Basin
Mountain Sheep
Tayo Park
Tayo Lake
Coon Lake
Mt. Mercer
Mt. Sheridan
Independent Mountain


KEY MAP
MONTANA
IDAHO
WYOMING
UTAH
IDAHO FALLS
AFTON
BIG PINEY
KEMMERER
ROCK SPRINGS
OGDEN
TETON CO
LINCOLN CO
WYOMING
ARBOR
HOBACK
Pritchard Pass
Red Pass
Wolf Mtn
Hot Springs
Holback
FOREST
CABIN CREEK
Pow Wow Point
Ferry Peak
ALPINE SUMMER HOMES AREA
ALPINE
Alpine Junction
AIRSTRIP
MARINA
PALISADES RES
CARIBOU N F
GAGING STATION
BRIDGE
R. 119 W.
R. 118 W.
Bradley Mountain
Skull
Raison Hollow
RIVERS
Greys River
GREYS AZ MK
MC CAIN
Waterdog Lake
Bull Hol
Stewart Peak
Gorral Canyon
Birch Creek
STAR
ETNA
ETNA MORMON CHURCH SPIRE
Etna
Cull Creek
Wolfley Canyon
Lee Creek
Prater Mountain
Prater
Salt River
Range
GENERALIZED AREAS
OF
WESTERN SPRUCE BUDWORM OUTBREAKS
BRIDGER, TARGHEE & TETON NATL. FORESTS
1971
LEGEND
INFESTATION INTENSITY
LIGHT DEFOLIATION L
MODERATE " " M
HEAVY " " H